

- 13 -

CLAIMS

1. A probe for the quantitative measurement of the feel of a surface (20), comprising:

- 5 - a prehensile casing (1);
 - a hollow contacting body (6) intended to be brought into contact with said surface in a probed region;
 - acoustic first detection elements (5) for
10 detecting noise emitted by the hollow body while it is in contact with said probed region; and
 - mechanical second detection elements (4, 7, 8) designed to measure the normal force or pressure and the friction force that are exerted by said surface on
15 said hollow body.

2. The probe as claimed in claim 1, in which the acoustic first detection elements comprise a microphone held inside said prehensile casing, this microphone
20 comprising a membrane (11) located inside said hollow body.

3. The probe as claimed in either of the preceding claims, in which the mechanical second detection
25 elements comprise at least one normal force sensor (4) designed to measure the normal force experienced by said hollow body while it is in contact with the probed region.

30 4. The probe as claimed in either of claims 1 and 2, in which the mechanical second detection elements comprise at least one normal pressure sensor designed to measure the normal pressure experienced by said hollow body while it is in contact with the probed
35 region.

5. The probe as claimed in one of the preceding claims, in which the mechanical second detection

elements comprise at least one friction force sensor (7, 8) designed to measure the friction force experienced by said hollow body while it is in contact with the probed region.

5

6. The probe as claimed in one of the preceding claims, which includes an elongate component (3) extending between two ends, which component is held inside the prehensile casing and is connected at one of its ends to said hollow body, said component being designed to transmit the normal and friction forces to the second detection elements.

7. The probe as claimed in the preceding claim, in which the friction force sensor comprises an accelerometer (7) and strain gauges (8) that are attached to said elongate component.

8. The probe as claimed in the preceding claim, in which said elongate component includes two lateral openings (35) so as to form two plates (36) on either side of said elongate component, said plates bearing said strain gauges.

9. The probe as claimed in the preceding claim, in which said elongate component is formed from a metal alloy.

10. The probe as claimed in one of the preceding claims, which comprises a diode (9) placed on the prehensile casing and intended to indicate the direction of movement of said probe while it is in contact with the probed region.

11. The probe as claimed in the preceding claim, in which the diode is linked to an optical camera in order to form a device for measuring the speed of movement of the hollow body over the probed region.

12. The probe as claimed in one of the preceding claims, in which the hollow body has a spherical shape.

13. The probe as claimed in one of claims 1 to 11, in
5 which the hollow body comprises a plane upper surface (6a) and a lower part consisting of a cylinder portion (6b).

14. The probe as claimed in one of claims 1 to 11, in
10 which the hollow body comprises an upper surface (6a) and a lower surface (6b) that are plane and approximately parallel, said hollow body having the shape of a parallelepiped.

15 15. The probe as claimed in one of the preceding claims, in which the hollow body is made of carbon fiber.

16. The probe as claimed in one of the preceding
20 claims, which includes transmission elements (12) for transmitting data from the first and second detection elements, and also from the speed measurement device, to an electronic computing unit (30).

25 17. The probe as claimed in the preceding claim, in which the electronic computing unit is designed to convert said data into simple quantities for quantifying the feel of said probed region.

30 18. The probe as claimed in the preceding claim, in which (8) is provided between said hollow body and said prehensile casing so as to allow normal and tangential movements of said hollow body.

35 19. The use of the probe as claimed in claims 1 to 18 for measuring the impact on the triboacoustic properties of a treatment applied to the probed surface.